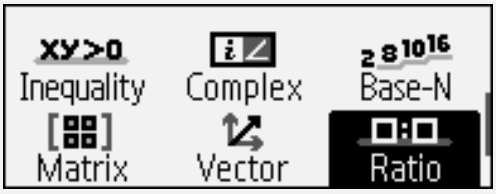
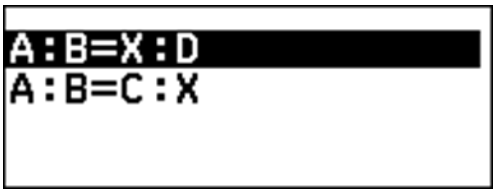
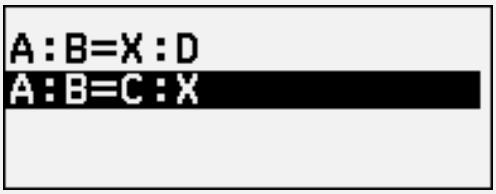
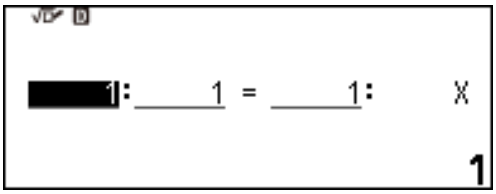
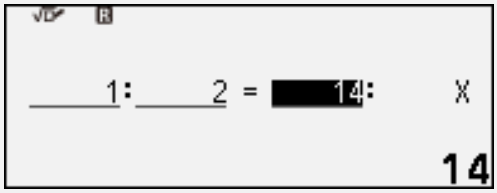
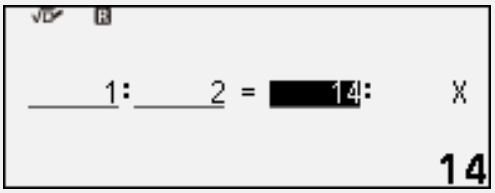
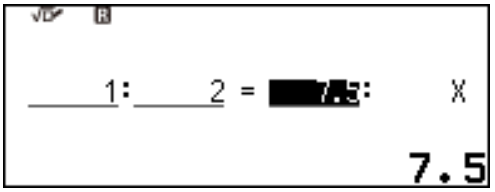
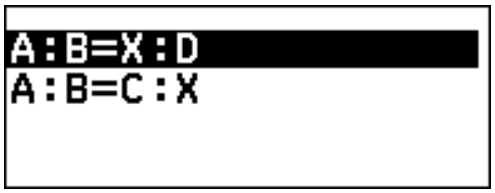
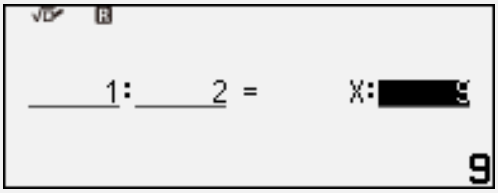
Unit 1: Lesson 7 – Scale Drawings

Activity 7.2: Sizing Up a Basketball Court

Skill: Solve scale drawing problems using proportions in the Ratio app.

Activity Summary:
This activity introduces students to the concept of scale, focusing on how it represents the relationship between lengths in a drawing and actual lengths. Students will learn different ways to express scale and apply this understanding by measuring a scale drawing of a basketball court to calculate real-world dimensions. The activity also highlights the potential for slight discrepancies between calculated measurements and official measurements due to rounding. The Ratio app on the calculator can be used to solve proportions.

1. Turn on the calculator with the ⏻ **- On button**. Press ⌂ **– Home** and then use the **arrows keys** to highlight the **Ratio app**.	
2. Press either OK or EXE to open the **Ratio app**. There are **2** options available depending upon where the **missing value** of **X** is located in your proportion.	
3. The **model** states it has a **scale** of "**1 cm to 2 m**". To find the **actual** court length for the **model** court length of **14 cm**, the proportion $\frac{1\ cm}{2\ m} = \frac{14\ cm}{X\ m}$ can be used. To enter the values for this proportion, press the **down arrow**, ⌄.	
4. Press either OK or EXE. Remember that the ratio ***a* to *b*** can be written as a fraction, $\frac{a}{b}$, or written with a colon, ***a* : *b***. This is the form of ratio displayed on this calculator.	
5. Enter the **3 known values** from our **proportion** using the number keys. Press 1 for the first entry. To move to the next entry, press either OK or EXE. Continue entering the other two values, **2** and **14**.	

6. Now that we have entered the **3 known values** of our **proportion**, press either [OK] or [EXE] to find the **missing value** of **X**. The **actual** length of the basketball court is **28 m**.	
7. To solve another proportion, press either [OK] or [EXE] to return to the entry template. The scale is the same. Press the **right arrow**, [▶], **twice** to be able to change the prior model length.	
8. The **width** of the **model** basketball court is **7.5 cm**. To change **14** in the template to **7.5**, type [7] [.] [5] and press either [OK] or [EXE].	
9. Press either [OK] or [EXE] to find the **missing value** of **X**. The **actual** width of the basketball court is **15 m**.	
10. Repeat the prior three steps to determine the hoop to hoop and 3-point line to sideline lengths of an **actual** basketball court. To predict the **model** length of the bench, press either [OK] or [EXE] to return to your last values in the template and then press the **back button**, [↩].	
11. To find a **model** length when the **actual** length is **9 m**, we need to solve the proportion $\frac{1\ cm}{2\ m} = \frac{X\ cm}{9\ m}$. Press either [OK] or [EXE] to choose the top template as the **unknown** is now in the **numerator**. Enter the new values for this proportion.	
12. Press either [OK] or [EXE] to find that the **model length** of the bench should be about **4.5 cm**. (If your result shows as **9/2**, either use the **Format key**, [FORMAT], and choose **Decimal** or press **Shift -** [⇧] [EXE] will directly give an **approximate(≈) decimal** result.)